

## Annex F

(informative)

### Application activity model

The application activity model (AAM) is provided to aid to understanding the scope and information requirements defined in this application protocol. The model is presented as a set of activity figures that contain the activity diagrams and a set of definitions of the activities and their data.

The viewpoint of the application activity model is that of the supplier of electrotechnical equipment who has the responsibility of designing, installing, and delivering an electrotechnical system.

#### F.1 Application activity model definitions and abbreviations

The following terms are used in the application activity model. Terms marked with an asterisk are outside the scope of this application protocol.

The definitions given in this annex do not supersede the definitions given in the main body of the text.

**F.1.1 Available components:** those components that are available to be used in the electrotechnical industrial system.

See figure F.6 for the context.

**F.1.2 Budgets\*:** framework of estimated expenses with respect to time, finance, material, and labour.

See figures F.2, F.3, and F.4 for the context.

**F.1.3 Change request:** any formal or informal request to modify an existing design or concept.

See figures F.2, F.4, F.5, F.6, and F.7 for the context.

**F.1.4 Components:** all parts or pieces of equipment used in the electrotechnical system.

See figures F.1, F.2, and F.6 for the context.

**F.1.5 Component test reports:** Documents or data verifying tested characteristics of a component.

NOTE - In many cases the test reports are produced by using specific testing or simulation systems. Even though test and simulation is out of scope of this part of ISO 10303 the test reports may be referenced by using the concepts of the external\_reference UoF.

See figure F.6 for the context.

**F.1.6 Contract:** a written or spoken agreement between two or more parties, intended to be enforceable by law.

See figures F.2, F.3, and F.4 for the context.

**F.1.7 Contracted list of requirements:** list of requirements as laid down in the contract.

See figures F.2, F.3, and F.4 for the context.

**F.1.8 Contracted system:** an electrotechnical system that represents the technical content of the contract.

See figures F.2, F.3, and F.4 for the context.

**F.1.9 Customer requirements:** needs, specifications or demands concerning design, operation or any other aspect of the electrotechnical system as laid down by the customer.

See figures F.1, F.2, and F.3 for the context.

**F.1.10 Design requirements:** the specific requirements the design must fulfill. These requirements are refinements of the more general contract requirements.

See figure F.5 for the context.

**F.1.11 Design system (AAM A31):** any actions to be taken to develop a definition of the electrotechnical system, or of parts thereof, based on the contract requirements.

See figure F.5 for the context.

**F.1.12 Detailed list of requirements:** a document containing the complete set of requirements the electrotechnical system has to fulfill.

NOTE - This set of requirements includes the contracted list of requirements as a subset. This document does not reflect on the realization of those requirements.

See figure F.4 for the context.

**F.1.13 Develop system (AAM A3):** all engineering activities that perform the functional design, physical design and those analyses to verify aspects of performance of the design in its intended environment. All sub activities required to transform the conceptual design into an implementable electrotechnical system are within this activity.

See figure F.2 for the context.

**F.1.14 Do conceptual design (AAM A2):** all of the sub-activities associated with transforming a customer's requirement or request from ideas to a conceptual design.

See figure F.2 for the context.

**F.1.15 Do detailed planning (AAM A21):** all of the sub-activities associated with the process of working out or updating detailed budgets, schedules, workloads and the like.

See figure F.4 for the context.

**F.1.16 Do inquiry (AAM A11):** the activities taken to investigate whether a vendor offers electrotechnical systems that meet the requirements of the customer.

See figure F.3 for the context.

**F.1.17 Document system design (AAM A32):** all activities needed to equip an electrotechnical system with documentation describing all aspects of the system needed during the subsequent phases of its life cycle.

See figure F.5 for the context.

**F.1.18 Documentation:** documentation subsumes all information and data whether in electronic or non-electronic form, like paper, that describes the equipment.

NOTE - Parts of the documentation will be handed over to the customer as instruction manuals or training material. In many cases the documentation is produced by using desktop publishing systems. Even though the data created by those systems may be structured in a way that is not supported by this part of ISO 10303 such data may be referenced by using the concepts of the external\_reference UoF.

EXAMPLE 55 - Examples include SGML- files, Postscript- files, and mock-ups.

See figure F.1, F.2, and F.5 for the context.

**F.1.19 Electrotechnical system as delivered:** electrotechnical system that is in a state where the commissioning and the hand over to the customer has taken place.

See figures F.1, F.2, and F.7 for the context.

**F.1.20 Engineer electrotechnical system (AAM A0):** all sub-activities to design, erect or validate an electrotechnical system.

See figure F.1 for the context.

**F.1.21 Erect system (AAM 42):** any actions to be taken to put up and to assemble the equipment using the available components.

See figure F.6 for the context.

**F.1.22 Explanatory documents:** any material or documentation intended to explain the design or technology of the system or any other related matter.

NOTE - In many cases explanatory documents are produced by using desktop publishing systems. Even though the data created by those systems may be structured in a way that is not supported by this part of ISO 10303 such data may be referenced by using the concepts of the external\_reference UoF.

See figure F.3 for the context.

**F.1.23 Function describing data:** documents or data describing the function of an electrotechnical system or portions thereof, like circuit diagrams, function diagrams, signal lists.

See figure F.5 for the context.

**F.1.24 Functional overview:** documents or data giving an overview about the functional building blocks and its structural breakdown.

See figure F.4 for the context.

**F.1.25 Guidelines\*:** principles or criteria guiding or directing the various activities throughout the process of designing the system.

See figures F.2 and F.4 for the context.

**F.1.26 Identify system (AAM A1):** all of the subactivities required to identify new electrotechnical systems.

NOTE - The activities are initiated from within the enterprise or as the result of an external customer request or requirement.

See figure F.2 for the context.

**F.1.27 Implement system (AAM A4):** all activities associated with the process of realizing a given design.

See figure F.2 for the context.

**F.1.28 Install system (AAM A51):** any actions to be taken to achieve the product as installed - milestone.

See figure F.7 for the context.

**F.1.29 Instruction manuals:** any documents and data used to inform the end-user how to operate or maintain the system.

NOTE - In many cases instruction manuals are produced by using desktop publishing systems. Even though the data created by those systems may be structured in a way that is not supported by this part of ISO 10303 such data may be referenced by using the concepts of the external\_reference UoF.

See figure F.5 for the context.

**F.1.30 List of allowed components:** a list of those parts and products that are allowed to be used in the design of the system.

NOTE - Possible restrictions or requirements imposed by the customer, the technology, or environmental conditions are considered.

See figures F.2, F.4, and F.5 for the context.

**F.1.31 List of available components:** a list of those parts and products that are available for use in the design of the system.

NOTE - Possible restrictions or requirements imposed by the customer, the technology, or environmental conditions are considered.

See figure F.5 for the context.

**F.1.32 List of requirements:** a relatively precise list of features, capabilities and other parameters specifying the desired design of the system.

See figure F.3 for the context.

**F.1.33 Location describing data:** documents or data mainly describing the topographical or geometrical position of electrotechnical systems or portions thereof.

EXAMPLE 56 - This includes assembly drawings describing geometric placement of components and cable routing drawings providing information about the routes of cables.

See figure F.5 for the context.

**F.1.34 Location-on-site data:** data providing information about the location of facilities on site.

See figures F.1, F.2, and F.5 for the context.

**F.1.35 Make contract (AAM A13):** all subactivities that lead to a contractual agreement between the customer and the vendor of an electrotechnical system.

See figure F.3 for the context.

**F.1.36 Make detailed list of requirements (AAM A22):** all subactivities that are associated to the process of detailing the initial list of requirements to work out a binding basis for the subsequent design process.

See figure F.4 for the context.

**F.1.37 Make offer (AAM A12):** all subactivities associated to the process of making an offer.

See figure F.3 for the context.

**F.1.38 Make specification (AAM A24):** all subactivities associated with the process of making a specification.

See figure F.4 for the context.

**F.1.39 Management issues\*:** data about the different activities throughout the completion of the design process of the system.

EXAMPLE 57 - Examples include plans and schedules concerning resources, personnel, cost, material, and time.

See figures F.2 and F.4 for the context.

**F.1.40 Material\*:** any material used in the process of designing and manufacturing the equipment.

See figures F.1, F.2, and F.6 for the context.

**F.1.41 Negotiated changes:** any modification that is the result of consultations between customer and supplier.

See figure F.3 for the context.

**F.1.42 Offer\*:** proposal of the supplier to solve the customers requirements.

See figure F.3 for the context.

**F.1.43 Offered system:** an electrotechnical system that represents the technical content of the offer.

See figure F.3 for the context.

**F.1.44 Order components from subcontractor (AAM A33):** any action to be taken to purchase the required components from a subcontractor.

See figure F.5 for the context.

**F.1.45 Orders to subcontractors:** data about the ordered items and the related contracts that are the legal basis for the orders.

EXAMPLE 58 - Examples include kind of ordered items, number, contractor, and identifier of the assigned contract.

See figures F.2, F.5, and F.6 for the context.

**F.1.46 Parts list:** data on the items that make up the system.

See figure F.5 for the context.

**F.1.47 People and machines\*:** any people and machinery used to design or to manufacture the system.

EXAMPLE 59 - Examples include workers, engineers, managers, and machine-tools.

See figure F.1 for the context.

**F.1.48 Product describing data:** the documentation or data that characterizes the equipment used in the system.

EXAMPLE 60 - The documentation may include information like the assembly hierarchy of products, bill-of-material, spare parts, label lists, assembly and installation instructions.

See figure F.5 for the context.

**F.1.49 Promotional material\*:** any material that supports the offer of the supplier and helps to convince the customer to buy the offered equipment.

See figure F.3 for the context.

**F.1.50 Put system into operation (AAM A5):** all subactivities associated with the start-up and commissioning.

See figure F.2 for the context.

**F.1.51 Receive ordered components (AAM A41):** any actions to be taken to receive and to administer the components ordered from a subcontractor.

NOTE - This activity includes all subactivities like an incoming inspection or a preparation of the components for their intended use.

See figure F.6 for the context.

**F.1.52 Refined budgets\*:** reworked or updated budget information.

See figures F.2 and F.4 for the context.

**F.1.53 Select equipment from subcontractors (AAM A23):** any actions to be taken to choose components, machinery and other apparatus from subcontractors that meet the requirements specified in the detailed list of requirements.

See figure F.4 for the context.

**F.1.54 Simulate designed system (AAM A34):** simulation of the functionality of a planned or existing electrotechnical system to verify or to improve the design.

See figure F.5 for the context.

**F.1.55 Specification:** any detailed description of the particulars of some projected work together with directions to be followed by the implementor.

NOTE - That includes data like functional description, dimensions or materials to be used. Specifications may contain schematic diagrams, tables or figures.

See figures F.2, F.4, and F.5 for the context.

**F.1.56 Standards and rules\*:** any international, national or company standards and rules used during the design process of an electrotechnical system.

See figure F.1 for the context.

**F.1.57 System as built:** the electrotechnical system is in this state when it is actually manufactured or constructed. Any change orders issued since release of the product-as-designed milestone are incorporated.

See figures F.2, F.6, and F.7 for the context.

**F.1.58 System as designed:** the electrotechnical system is in this state when the conceptual design according to the contractual requirements or according to the specification is completed. All parts of the electrotechnical system are specified completely.

See figures F.2, F.5, and F.6 for the context.

**F.1.59 System as installed:** the electrotechnical system is in this state when in place at the customers site and the process of doing the settings has taken place. The system meets the specification of the customer.

See figure F.7 for the context.

**F.1.60 Test (AAM A43):** any actions to be taken to verify the ability of the electrotechnical system, or parts thereof, to satisfy the specified functionality and performance.

See figure F.6 for the context.

**F.1.61 Test reports:** documents or data verifying tested characteristics of an item.

NOTE - In many cases test reports are produced by using desktop publishing systems. Even though the data created by those systems may be structured in a way that is not supported by this part of ISO 10303 such data may be referenced by using the concepts of the external\_reference UoF.

See figures F.2, F.6, and F.7 for the context.

**F.1.62 Test system (AAM A52):** final inspection of the functionality and performance of the installed electrotechnical system to validate its ability to satisfy the requirements of the customer.

See figure F.7 for the context.

**F.1.63 Tests\*:** all data used to determine the ability of the design or its implementation to satisfy particular requirements.

EXAMPLE 61 - Examples include abstract test cases and executable test cases.

See figures F.2, F.5, F.6, and F.7 for the context.

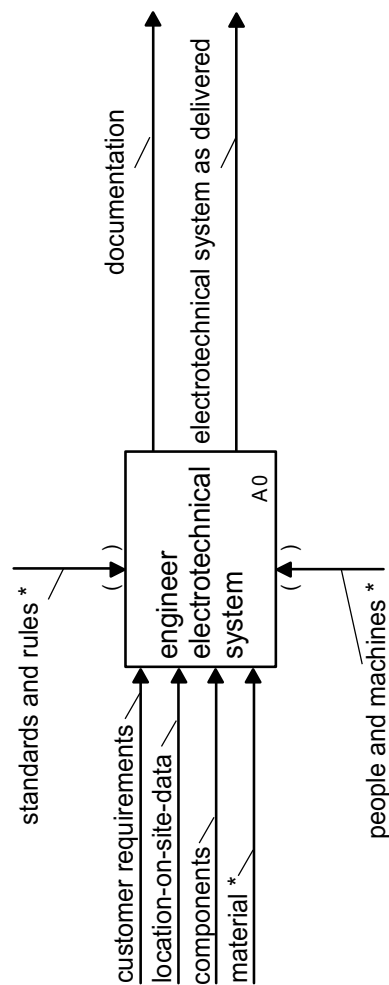
**F.1.64 Training material:** any documents and data used to educate the end-user.

NOTE - In many cases training material is produced by using desktop publishing systems. Even though the data created by those systems may be structured in a way that is not supported by this part of ISO 10303 such data may be referenced by using the concepts of the external\_reference UoF.

See figure F.5 for the context.

## F.2 Application activity model diagrams

The application activity model diagrams are given in figures F.1 through F.7. The graphical form of the application activity model is presented in the IDEF0 activity modelling format. Activities and data flows that are out of scope are marked with asterisks.



**Figure F.1 - AAM diagram of node A-0 : Electrotechnical design and installation**

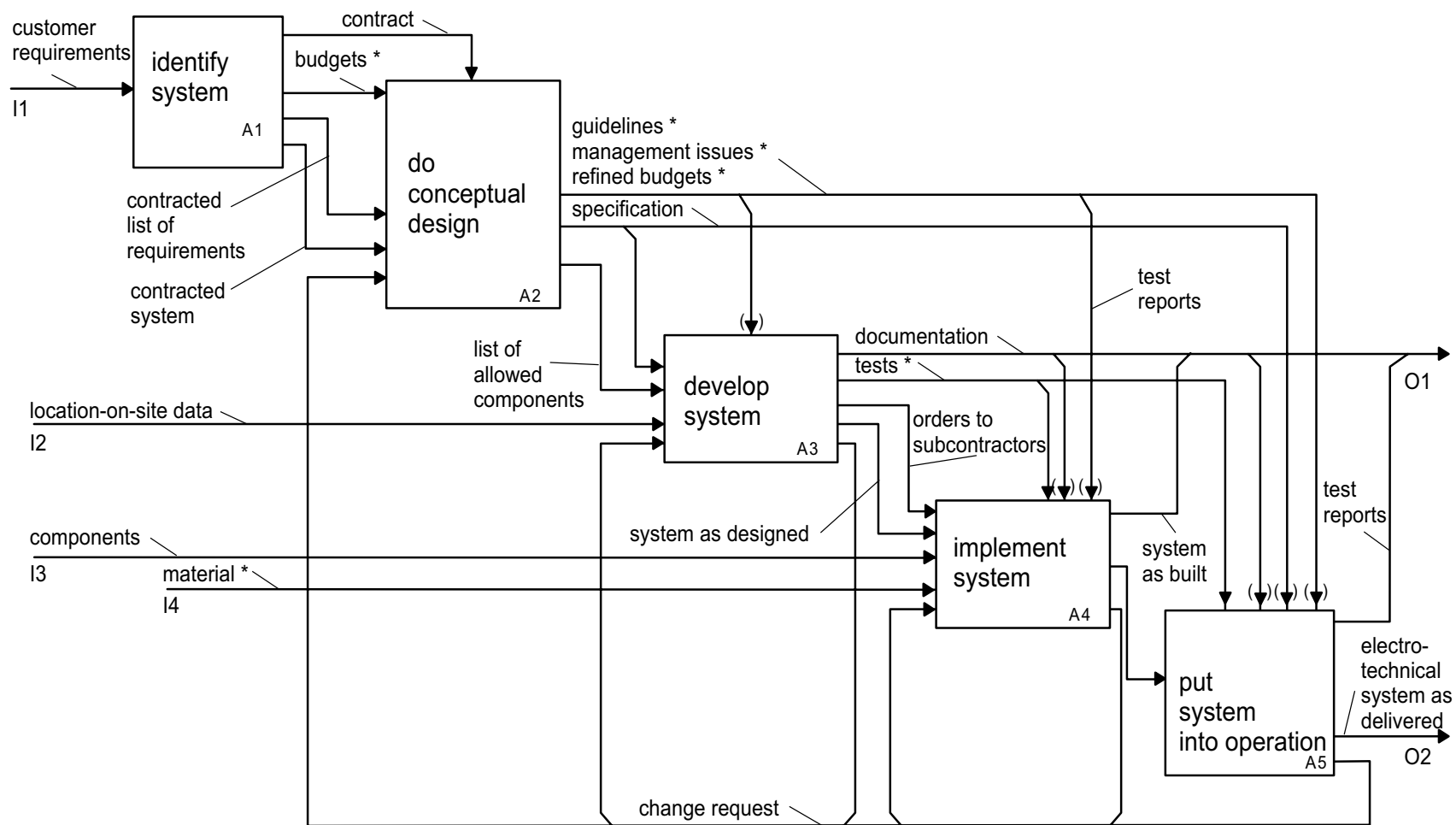
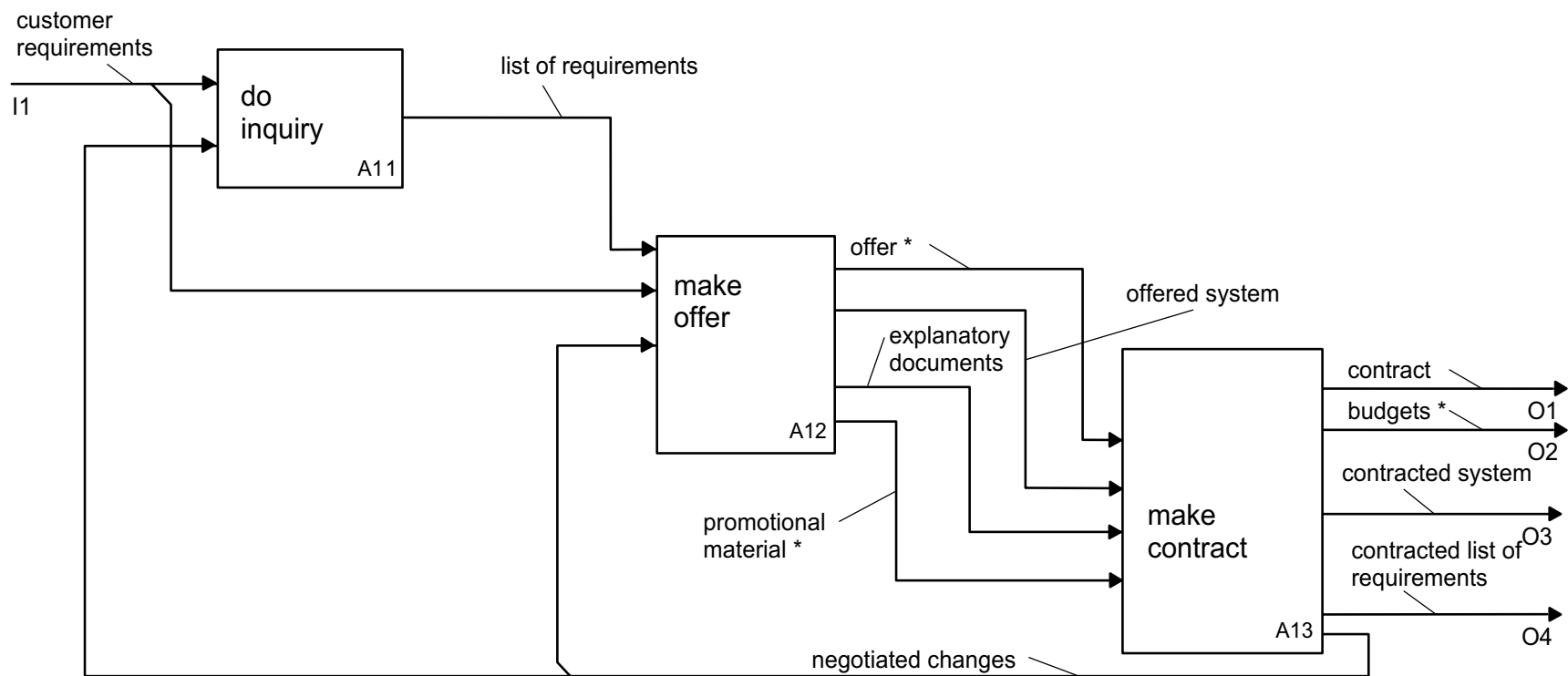


Figure F.2 - AAM diagram of node A0: Engineer electrotechnical system



**Figure F.3 - AAM diagram of node A1: Identify system**

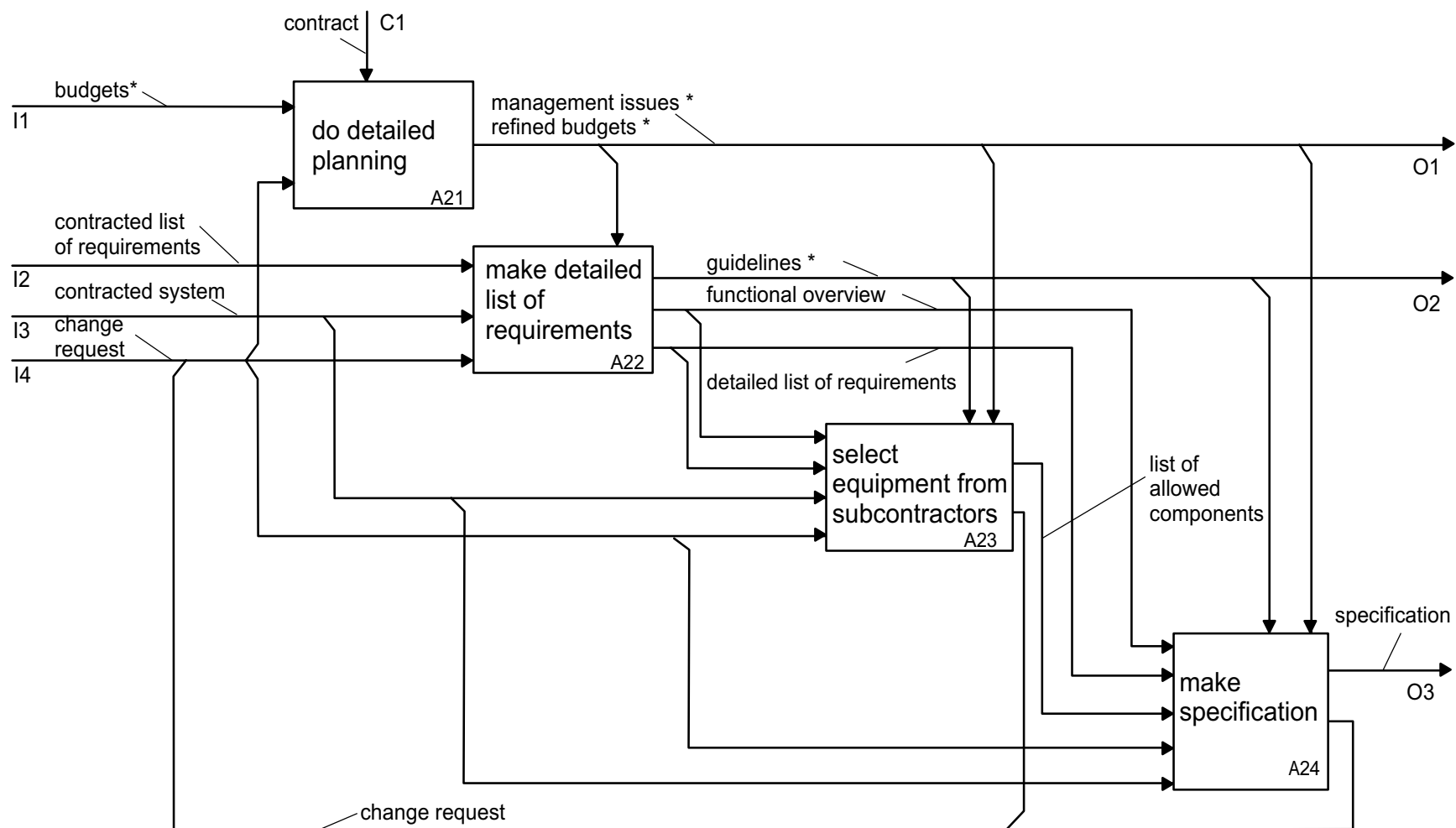
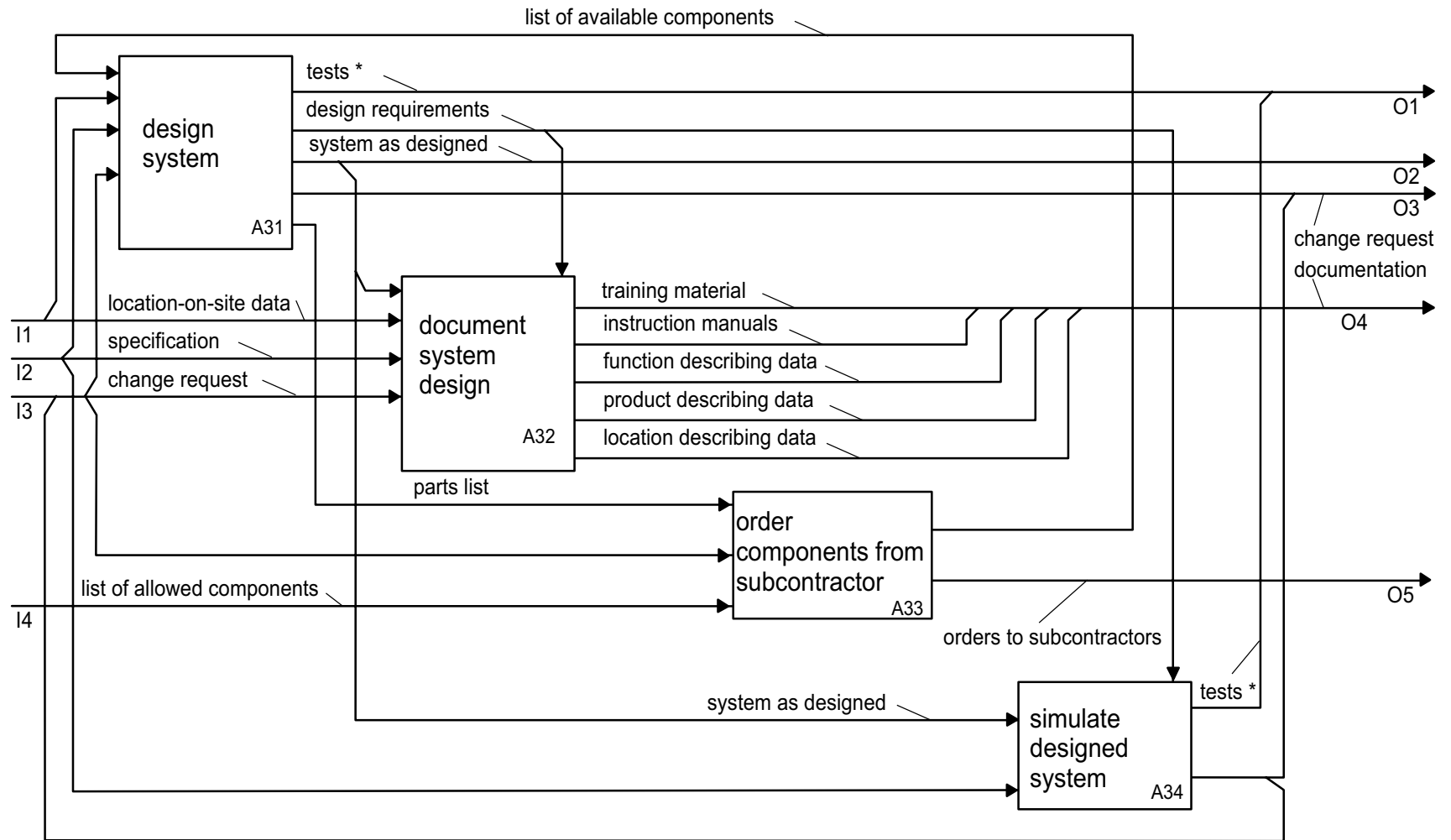
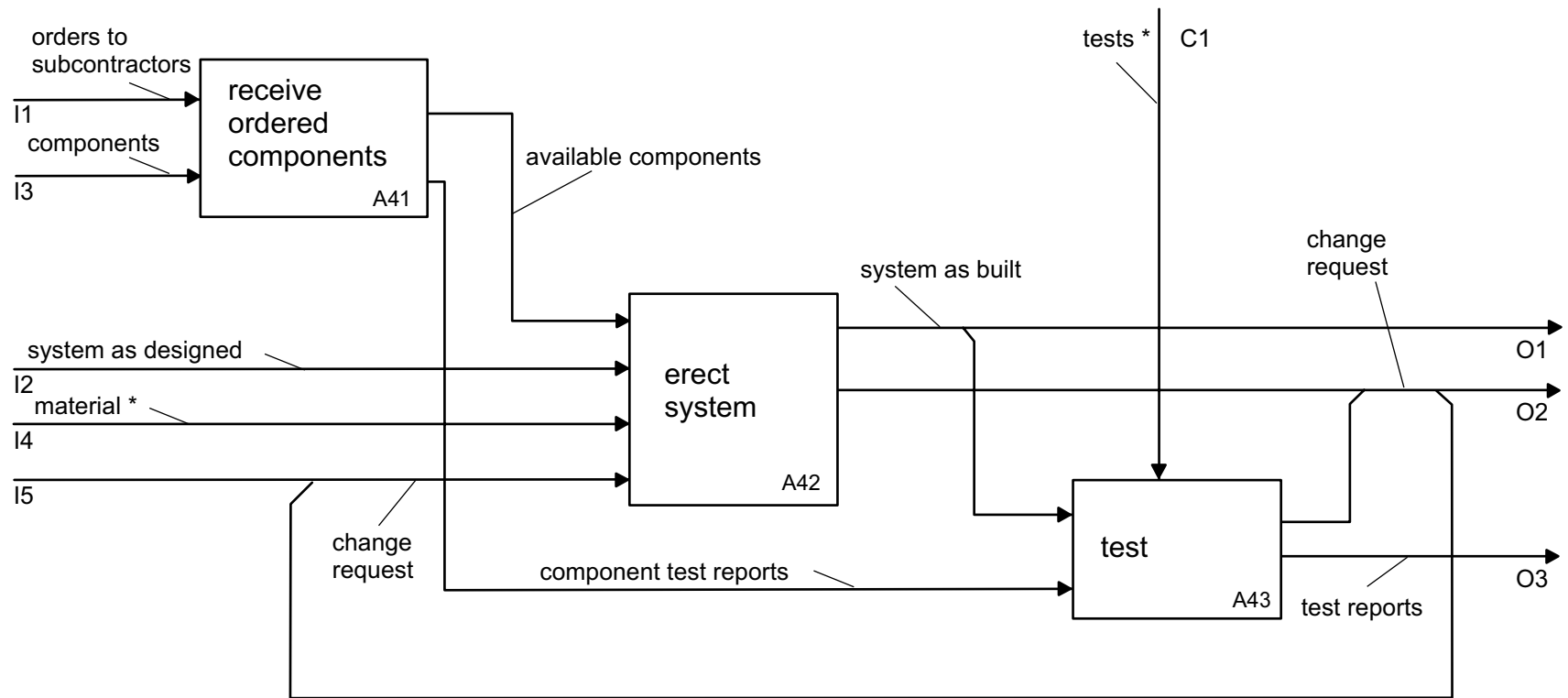


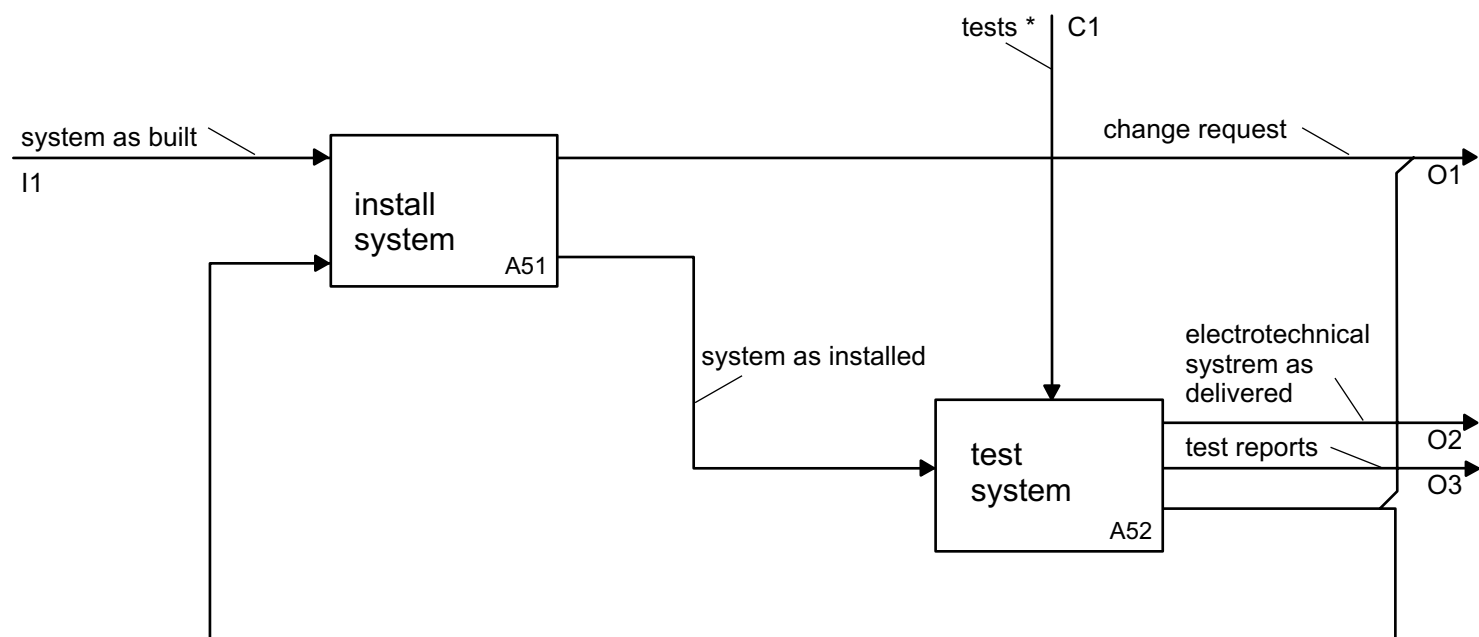
Figure F.4 - AAM diagram of node A2: Do conceptual design



**Figure F.5 - AAM diagram of node A3: Develop system**



**Figure F.6 - AAM diagram of node A4: Implement system**



**Figure F.7 -AAM diagram of node A5: Put system into operation**

Table F.1 consists of five columns. The first column contains the name of the data class in the AAM. In the columns two, three and four the data classes are marked to be in scope or out of scope.

The classification "in scope - full support" means that corresponding application objects are provided in clause 4 of this part of ISO 10303.

The classification "in scope - reference only" means that the explicit description of the data is not specified by this part of ISO 10303, but it may be referenced to.

EXAMPLE 62 - The data description of a documentation done with a desktop publishing system is not specified by this part of ISO 10303. The reference to this data, the knowledge about its existence and about its type, creator, etc, is supported by this part of ISO 10303.

Data classes classified as "out of scope" are not supported by this part of ISO 10303. In the figures data classes that are out of scope are marked with asterisk after its names.

The fifth column of Table F.1 lists the correspondence of the data classes to the UoFs specified in clause 4.

NOTE - The table reflects the assignment of UoFs that is considered to be highly probable. Depending from the actual situation the data may contain information from other UoFs.

EXAMPLE 63 - UoFs approbation, properties, category, item\_designation

**Table F.1 - AAM - data classes**

Data flow	In scope		Out of scope	UoF correspondence
	full support	reference only		
Available components	X			product_structure, products_and_connections, properties, category
Budgets			X	
Change request	X			documentation, work_assignment, configuration_management
Components	X			product_structure, products_and_connections, category
Component test reports		X		documentation, external_reference
Contract	X			approbation
Contracted list of requirements	X			conditions, documentation, category
Contracted system	X			all Units of Functionality
Customer requirements	X			conditions, documentation, external_reference, category, properties
Design requirements	X			conditions, documentation, external_reference, category, properties
Detailed list of requirements	X			conditions, documentation, external_reference, category, properties
Documentation	X			all Units of Functionality
Electrotechnical system as delivered	X			all Units of Functionality
Explanatory documents	X			documentation, dimensioned_documentation, external_reference, category
Function describing data	X			functions_and_networks, messages, properties, documentation, dimensioned_documentation, external_reference, category

**Table F.1 - AAM - data classes (continued)**

Data flow	In scope		Out of scope	UoF correspondence
	full support	reference only		
Functional overview	X			functions_and_networks, messages, properties, category
Guidelines			X	
Instruction manuals	X			documentation, dimensioned_-documentation, external_reference, category
List of allowed components	X			product_structure, products_and_-connections, category
List of available components	X			product_structure, products_and_-connections, category
List of requirements	X			conditions, documentation, external_-reference, category
Location describing data	X			installation, properties, documentation, dimensioned_-documentation, properties, category
Location-on-site data	X			installation, properties, documentation, dimensioned_-documentation, properties, category
Management issues			X	
Material			X	
Negotiated changes	X			conditions, configuration_-management, documentation, properties, category
Offer			X	
Offered system	X			all Units of Functionality
Orders to subcontractors	X			approbation
Parts list	X			product_structure, category

**Table F.1 - AAM - data classes (concluded)**

Data flow	In scope		Out of scope	UoF correspondence
	full support	reference only		
People and machines			X	
Product describing data	X			product_structure, products_and_connections, properties, documentation, properties, category
Promotional material			X	
Refined budgets			X	
Specification	X			all Units of Functionality
Standards and rules			X	
System as built	X			all Units of Functionality
System as designed	X			all Units of Functionality
System as installed	X			all Units of Functionality
Test reports		X		documentation, category, external_references
Tests			X	
Training material	X			documentation, dimensioned_documentation, category, external_references